

Name : _____

Score : _____

Teacher : _____

Date : _____

Simplify the Radicals

1) $\sqrt{384} =$

2) $\sqrt{169} =$

3) $4\sqrt{75} =$

4) $12\sqrt{72} =$

5) $\sqrt{20} =$

6) $\sqrt{27} =$

7) $\sqrt{289} =$

8) $6\sqrt{726} =$

9) $\sqrt{256} =$

10) $\sqrt{121} =$



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Simplify the Radicals

1) $\sqrt{384} = \sqrt{64 \times 6} = \sqrt{64} \times \sqrt{6} = 8\sqrt{6}$

2) $\sqrt{169} = 13$

3) $4\sqrt{75} = 4\sqrt{25 \times 3} = 4 \times \sqrt{25} \times \sqrt{3} = 4 \times 5 \times \sqrt{3} = 20\sqrt{3}$

4) $12\sqrt{72} = 12\sqrt{36 \times 2} = 12 \times \sqrt{36} \times \sqrt{2} = 12 \times 6 \times \sqrt{2} = 72\sqrt{2}$

5) $\sqrt{20} = \sqrt{4 \times 5} = \sqrt{4} \times \sqrt{5} = 2\sqrt{5}$

6) $\sqrt{27} = \sqrt{9 \times 3} = \sqrt{9} \times \sqrt{3} = 3\sqrt{3}$

7) $\sqrt{289} = 17$

8) $6\sqrt{726} = 6\sqrt{121 \times 6} = 6 \times \sqrt{121} \times \sqrt{6} = 6 \times 11 \times \sqrt{6} = 66\sqrt{6}$

9) $\sqrt{256} = 16$

10) $\sqrt{121} = 11$



A. Convert Mixed Radicals to Entire Radicals / Entire Radicals to Mixed Radicals

1. Convert the following mixed radicals to entire radicals.

a) $7\sqrt{5}$

b) $2\sqrt[3]{4}$

c) $-2\sqrt[4]{3}$

d) $-10\sqrt[3]{7}$

e) $8\sqrt{10}$

f) $\frac{1}{3}\sqrt[3]{9}$

2. Write each mixed radical as an entire radical.

a) $3\sqrt[3]{\frac{7}{3}}$

b) $-\frac{2}{3}\sqrt[4]{\frac{5}{8}}$

c) $-\frac{2}{3}\sqrt{\frac{2}{3}}$

B. Convert mixed Radicals to Entire Radicals / Entire Radicals to Mixed Radicals

1. Write each mixed radical as an entire radical.

a) $6\sqrt{5}$

b) $3\sqrt[3]{4}$

c) $-2\sqrt[3]{5}$

d) $-5\sqrt[4]{2}$

2. Convert the following to mixed radicals in simplest form.

a) $\sqrt{50}$

b) $\sqrt{60}$

c) $\frac{1}{2}\sqrt{320}$

d) $\sqrt[3]{54}$

e) $\sqrt[3]{3000}$

f) $\sqrt[3]{-81}$

g) $-5\sqrt[4]{162}$

h) $\sqrt[5]{-160}$

Answers A

1. a) $\sqrt{245}$ b) $\sqrt[3]{32}$ c) $-\sqrt[4]{48}$ d) $\sqrt[3]{-7000}$ e) $\sqrt{640}$ f) $\sqrt[3]{\frac{1}{3}}$
2. 3a) $\sqrt[3]{63}$ b) $-\sqrt[4]{\frac{10}{81}}$ c) $-\sqrt{\frac{8}{27}}$

Answers B

1. a) $\sqrt{180}$ b) $\sqrt[3]{108}$ c) $\sqrt[3]{-40}$ d) $-\sqrt[4]{1250}$
2. a) $5\sqrt{2}$ b) $2\sqrt{15}$ c) $4\sqrt{5}$ d) $3\sqrt[3]{2}$ e) $10\sqrt[3]{3}$ f) $-3\sqrt[3]{3}$ g) $-15\sqrt[4]{2}$ h) $-2\sqrt[5]{5}$

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Algebra 2

Fractional and Negative Exponents

1. Simplify the following. Use the rules of exponents. Hint: Turn radicals into fractional exponents.

a. $\frac{x^8}{x^3}$

b. $\frac{x^{\frac{3}{4}}}{\sqrt{x}}$

c. $\sqrt{x^3} \cdot x^2$

d. $4^{1/3} \cdot 4^{1/5}$

e. $4^{1/3} + 4^{1/5}$

f. $5^{2/3} \cdot \sqrt[3]{5}$

g. $\frac{3^{1/2}}{3^{1/3}}$

h. $\frac{7^{1/2}}{7^{1/3}}$

i. $\frac{9}{\sqrt{9^3}}$

2. More practice with exponents. This has a mix of negative and fractional exponents!

a. $\frac{1}{8^{-2}}$

b. $\frac{4^{10}}{4^8}$

c. $(2^{-2})^3$

d. $\frac{2^{17} \cdot 2^{-21}}{2^{-1}}$

e. $\left(\frac{2}{3}\right)^{-2}$

f. $\left(\sqrt[4]{x^5}\right)^8$

g. $(x^4)^2 \cdot x^3 - x^5$

h. $x^{\frac{1}{2}} \cdot x^{\frac{3}{4}} \cdot y^0$

i. $\left(\frac{2x^2}{y^3}\right)^4$

j. $\sqrt[3]{x^{12}y^9}$

k. $\sqrt{\sqrt{x^8}}$

l. $(-2x)^{-2}$

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m. $\frac{8^5}{8^7}$

n. $\frac{1}{4^{-2}}$

o. $5^1 + 5^0 + 5^{-1}$

p. $\left(\frac{5}{3}\right)^{-2}$

q. $(2^{-3})^2$

r. $2^{-2} + 4^{-2}$

s. $(2 + 4)^{-2}$

t. $(2x^{-1})^3 \cdot x$

u. $(x^{\frac{1}{2}})^2$

v. $x^{\frac{1}{2}} \cdot x$

w. $\left(\frac{2}{x}\right)^{-3}$

x. $2x^{-3}$

y. $(2 + x)^{-2}$

z. $\sqrt{x} \cdot x^{\frac{3}{2}}$

3. A little more practice!!

a. $\sqrt{x^{14}}$

b. $(2^{-2} \cdot 3^{-1})^0$

c. $\sqrt{x^{4/3}}$

d. $\left(\frac{-2x^2}{y^5}\right)^5$

e. $x^3 \cdot x^2 + 2x^5 \cdot x^0$

f. $(x^2)^4 + \frac{x^4}{x^2}$

g. $\frac{x^{-3}}{x^{-4}}$

h. $\sqrt[5]{x^2} \cdot \sqrt[4]{x}$

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Answers:

1a. x^5 b. $x^{1/4}$ c. $x^{5/2}$

d. $4^{8/15}$ e. same f. 5

g. $3^{1/6}$ h. $7^{1/6}$ i. $1/3$

2a. 64 b. 16 c. $1/64$

d. $1/8$ e. $9/4$ f. x^{10}

g. $x^{11} - x^5$ h. $x^{5/4}$ i. $\frac{16x^8}{y^{12}}$

j. x^4y^3 k. x^2 l. $\frac{1}{4x^2}$

m. $\frac{1}{64}$ n. 16 o. $\frac{31}{5} = 6\frac{1}{5}$

p. $9/25$ q. $1/64$ r. $5/16$

s. $1/36$ t. $\frac{8}{x^2}$ u. x

v. $x^{3/2}$ w. $\frac{x^3}{8}$ x. $\frac{2}{x^3}$

y. $\frac{1}{(2+x)^2}$ z. x^2

3a. x^7 b. 1 c. $x^{2/3}$

d. $\frac{-32x^{10}}{y^{25}}$ e. $3x^5$ f. $x^8 + x^2$

g. x h. $x^{13/20}$

